

## A7-R4: INTRODUCTION TO DATABASE MANAGEMENT SYSTEM

### Objective of the Course

This course will allow students to develop background knowledge as well as core expertise in Database Management Systems. The students will learn Database concept, Data Structure, Data Models, various approaches to Database design, strengths of relational model, Normalization.

At the end of the course the student will be able to

- Understand Database design and normalisation techniques.
- Use Standard Query Language and its various versions.
- Understand Importance of backup and recovery techniques.
- Develop Database system to handle the real world problem.

### Outline of Course

S. No.	Topic	Minimum number of hours
1.	An overview of Database Management System	04
2.	An architecture of the database system	04
3.	Relational Database Management System	08
4.	Normalization	08
5.	Relational algebra and relational calculus	08
6.	The SQL Language	12
7.	Backup and recovery	02
8.	Security	02
9.	Integrity	02
10.	Design and development of database applications	10
	<b>Lectures</b>	<b>= 60</b>
	<b>Practical/tutorials</b>	<b>= 60</b>
	<b>Total</b>	<b>= 120</b>

### Detailed Syllabus

- 1. An overview of the Database Management System** **04 Hrs.**  
What is database?, Why database?, database system, database management system (DBMS), advantages of DBMS.
- 2. An architecture of the database system** **04 Hrs.**  
Three levels of architecture, mappings, role of database administrator(DBA), E-R model, three approaches of DBMS- relational, hierarchical and network.
- 3. Relational Database Management (RDBMS)** **08 Hrs.**  
Introduction, RDBMS terminology, relational model, base tables, keys.
- 4. Normalization** **08 Hrs.**  
Normal forms, Boyce-Codd Normal form, higher normal forms.

<b>5. Relational algebra and Relational calculus</b>	<b>08 Hrs.</b>
Relational operators, tuple calculus, well formed formulae.	
<b>6. The SQL language</b>	<b>12 Hrs.</b>
Introduction , Characteristics of SQL, data definition, data manipulation, SQL commands, SQL operators, Queries, aggregate functions.	
<b>7. Backup and recovery</b>	<b>02 Hrs.</b>
Transaction recovery, system recovery, SQL support	
<b>8. Security</b>	<b>02 Hrs.</b>
General considerations, controls, audit trail, data encryption, SQL support.	
<b>9. Integrity</b>	<b>02 Hrs.</b>
General considerations ,integrity rules, SQL support.	
<b>10. Design and development of database applications</b>	<b>10 Hrs.</b>
Database applications using some standard RDBMS.	

## **RECOMMENDED BOOKS**

### **MAIN READING**

1. Silberschaty A and Korth H.F, "Database System Concepts", Fifth Edition, TMH (2006)
2. C.J.Date, " An introduction to database systems", Addison\_Wesley.
3. R. Elamsri, S. Navathe, " Fundamentals of database system, Addison Wesley
4. An introduction to database systems", Galgotia

### **SUPPLEMENTARY READING**

1. Leon An Leon DBMS, Vikas Publishing House (latest edition)